A NEW BLUEPRINT FOR DECENTRALIZED ENERGY

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Here is an important question. What is the most effective way to accelerate the global use of decentralised energy (DE) - high efficiency cogeneration and on-site renewable energy generation?

Your answer might be to encourage policymakers to provide grants and other special incentives for favoured DE technologies. Or you might suggest the introduction of specific policies to reduce carbon emissions from the electricity generation sector. Another option you might prefer is to put specific constraints on the development of central power stations remote from consumers. Or you could believe that full liberalisation and restructuring of the market is the best way for economically efficient DE systems to secure their fair place in the power market.

All of these approaches have been used in different parts of the world. Some work, some do not. Where direct and positive policy intervention has taken place, this can be extremely effective for the period the intervention is in force. The problem has been that these incentives can be taken away as quickly as they are introduced, sending a buoyant market into a tailspin.

Not only that, but specific policies aimed at stimulating a market for DE are often only necessary because of separate and persistent, institutional and regulatory barriers which cause DE investment to be either impractical or financially unattractive. In other words, they simply serve as a neutraliser to offset the negative consequences of unnecessary market constraints. It is analogous to taking pills to cure a hangover when it would be easier and less costly (and perhaps less fun) to avoid drinking too much in the first place.

Let us be quite clear about this. There are a host of DE power generation solutions which are cost-effective today. The wider deployment of DE is not technologically constrained – the technologies exist today, they are economically efficient (as WADE's economic work has conclusively shown) and as time goes by there will be additional emerging technologies which also become cost-effective. The challenge is not that DE is economically suboptimal – as many continue to believe – but that electricity markets have evolved in such a way as to suit the technical and conventional wisdom that central generation is the cheapest way to produce electricity. The regulation of such markets continues to favour central power despite the existence of economically superior decentralised alternatives. That is why well-intentioned governments that wish to see more DE turn to special incentive programmes to overcome a deeply ingrained bias towards central generation.

This is the reason why the final policy option in the second paragraph, the restructuring of electricity markets, is not working particularly well either. Deregulation and restructuring usually involves the reduction, not elimination, of monopoly power together with some privatisation and separation of vertically integrated utilities. Often, little more is involved. The incentive remains to generate electricity centrally and transport the energy uni-directionally from the station to the consumer. This is not a comfortable environment for DE, and it never will be.

One of WADE's principal missions is to demonstrate the great economic value of modernising the regulation of electricity markets everywhere. We are developing, with our members, a set of principles for electricity market regulation which we intend to serve as a balanced blueprint for power sector reform worldwide. Together with our convincing demonstration of the economic benefits of deploying DE rather than central power, we believe that such a blueprint can serve as an effective tool and guide for policymakers and regulators throughout the world. This article summarises WADE's ten draft principles, which have been designed to be fair to all parties and not to grant any special treatment or favour to DE.

We welcome your comments and feedback, to info@localpower.org.

PRINCIPLE 1. *There must be a fully independent and properly resourced regulator of the system. His/her duties should relate to reducing costs and prices, reducing emissions of pollutants (including greenhouse gases), cutting the use of fossil fuels and minimising the risks of system disruption.*

The job of the electricity market regulator should be seen as similar to that of a boxing fight referee who is supervising a fight between five boxers, all of whom are trying to knock the rest down. Sadly, in most countries, there is one heavyweight boxer and the rest are lightweights, with an occasional punch from the big man landing on the poor referee. WADE believes that the regulator must have the authority, capability and resources to treat all system actors in a dispassionate way. It is also important that the responsibilities of the regulator should go significantly beyond that of seeking to minimise consumer prices. Depending on national circumstances, there should also be duties relating to the environment, energy security and service quality. For example, it makes little sense for a country to take on stringent greenhouse gas emission reduction commitments while giving the electricity system regulator no responsibility in this area.

PRINCIPLE 2. *Electricity system pricing should be fully cost reflective with no cross subsidies from one part of the system to another*.

This should be an obvious requirement for any competitive market system. Cross subsidies deters fair competition, increase costs and disincentivise efficiency and the optimal use of resources. It can allow, for example, one part of the system to subsidise price cutting to prevent competition from new entrants. In countries with a nationalised system, it can enable state support of monopoly companies that results in artificially low electricity prices, again discouraging competition.

PRINCIPLE 3. *Power generation and supply companies should have no ownership or management interest in the network.*

The network must be separated from other parts of the system. This is vital for the simple reason that unreasonable network pricing or access constraints can be used as a highly effective tool to discourage competition from other generators and/or suppliers of electricity.

PRINCIPLE 4 *All generators of electricity should have fair and non-discriminatory access to the grid*.

This relates to Principle 3 and is one of the most important issues which regulators must deal with to enable effective and fair interconnection between DE generators and the grid. In every survey or report which

addresses the barriers to cogeneration or renewable energy, the issue of grid access is near the top of the list. Everyone in the industry has a story about an outrageous charge from a local supply company for connection, an unreasonable technical stipulation or inexplicable delays in processing paperwork. Without straightforward and fair (to both DE developer and network operator) procedures for enabling access, DE can never flourish.

PRINCIPLE 5. *Use of T&D networks should be priced according to the services they provide and not in such a way as to incentivise distribution companies to avoid DE interconnection.*

This necessarily relates closely to Principle 4 above, but applies specifically to the costs of using the system as opposed to securing connection to it. The central point here is this: if network charging structures provide incentives for network operators to transport as many electrons as possible through their wires, there will be a substantial disincentive for the operator to connect a DE generator whose presence will inevitably lead to a reduction in that flow. This is a good example of how current system management has evolved to sit with a central power model sending electricity in one direction. The network should earn revenue according to the services it provides, mainly its *existence* as a means of carrying electricity and its *capability* to provide backup supplies.

PRINCIPLE 6. *Utilities should be required to engage in cost benefit analysis which can enable DE to be developed in areas where its local benefits outweigh the costs of constructing or upgrading new distribution facilities*.

In a separate article in this issue, Richard Brent outlines his view of 'a fair and simple plan for utilities and policymakers'. A cornerstone of his proposal is that distribution utilities should be required to engage in localised least cost planning processes for their distribution facilities. By doing so, this would be able to compare the cost of upgrading or constructing new distribution facilities with that of installing decentralised energy generation facilities (which can also reduce the amount of energy and/or capacity that the utility should build or buy). If a utility deemed that investment in DE were to be a lower cost option, it could either undertake the investment itself or provide 'zonal' credits to a DE developer in the form of reduced distribution charges.

PRINCIPLE 7. *Any benefits which generators (including DE) provide to the system (for example, voltage and frequency support, grid reliability and stability, reduction in T&D losses, reduced requirements for 'spinning reserve') should be fully and fairly reflected in system pricing*.

This relates to Principle 6 but in broader system terms. The range of

'ancillary' benefits of DE are widely recognised and well understood but are rarely priced as a benefit provision in its favour. In part, this is because it is difficult to quantify precisely the extent of the benefit. Nonetheless, regulators should aim to come to agreement with system operators and users on how these benefits can be fairly ascribed to DE projects through the charges paid for use of the network.

PRINCIPLE 8. *Equally, generators (including DE) should not be excessively charged for their system impacts (for example, the use of 'shallow' rather than 'deep' connection charging). In particular, back-up charging for DE should fairly and transparently reflect system impact and no more.*

Alongside the issue raised in Principle 3, that of access to the network, the issue of back-up charges is one of the most notorious barriers to the wider use of DE, in particular high efficiency cogenerators. A project can stand up commercially in a robust way – until it becomes apparent what it will have to pay a heavy price for the benefit of receiving an assured back-up supply. Throughout the world, this is one of the most effective ways for a network operator or distribution utility to kill a project should it wish to. Moreover, it can usually do so without any need to justify itself, nor with any concern that the project developer can have the issue independently assessed.

PRINCIPLE 9. *Regulatory planning should take into account time perspectives of up to 20 years to provide sufficient market stability to developers and investors.*

This is a more difficult one. Long-term planning is often associated with centralised bureaucracies and state control. On the other hand, experience of liberalised electricity markets tells us that there is a tendency to profit maximisation in the short-term – a natural objective for commercially driven companies. Extending the time horizon beyond five years for regulators is particularly important because of the long lives of power generation projects. A certain anticipation is needed by the regulator to ensure that tomorrow's national environmental and energy security objectives can be accommodated by today's investments. Not only that, project developers and investors need some comfort (though not too much) that regulatory conditions will not change in a substantially adverse way during the life-time of their project so that their project returns shrink dramatically or evaporate. If no such assurance exists, the right projects are less likely to be developed.

PRINCIPLE 10. *The electricity system should be subject to market based instruments, for example emissions trading, energy taxation and output-based standards, which reflect energy conversion efficiencies and internalise environmental costs.*

Bar the ongoing drive for cost reduction, the most important challenge for the power industry in industrialised countries is to make a substantial contribution to an ever growing range of environmental objectives. The most important of these is climate change and the most economically efficient means of reducing the greenhouse gas emissions which cause it is a broad-based emissions trading system which covers as fully and fairly as possible the power generation sector. The most significant emerging scheme is that being developed by the European Union for implementation across 28 countries in 2005. It will apply to the electricity sector, though perversely it discriminates against high efficiency cogeneration. The power sector also produces other emissions which are regulated in a wide array of ways around the world. Sadly, few of these deal with the issue in the most sensible way – by limiting emissions according to the efficiency of energy conversion. The widespread application of output based emissions standards would ensure that the minimum amount of emissions is produced alongside the maximum amount of useful energy generation – surely the goal for which regulators should be striving.

Writing from the perspective of an industrialised country, it is easy to lose sight of the fact that a significant majority of new electrical capacity needs in the future will arise in developing countries, not in the OECD group of industrialised countries. Let us ask then, can these principles apply to developing countries as they do for the OECD? There is no question that they do and that they should. The central challenge for many such countries is to increase access to electricity for their people and businesses at the lowest possible cost while minimising local and regional environmental degradation. Climate change is an issue for developing countries, but the onus is not so great on them as it is for the OECD.

Increasing capacity at least economic and environmental cost is best done through substantial investment in on- and off-grid DE, and not in less efficient and more costly central power with its associated T&D network. Thus if regulators and policymakers in developing countries can be guided by the principles advocated by WADE, they can achieve their key social goals at reduced cost, through the use of indigenous resources and with significantly reduced environmental impact.

The case for DE is an overwhelming one. The case for the modernisation of electricity market regulation which enables DE to compete on level terms with central generation is even more powerful.

The challenge, a monumental one, is to advocate as persuasively and powerfully as possible for the implementation of these principles in every state, country and region in the world. That is WADE's task.

Please send your comments on these principles to info@localpower.org. WADE would like to thank Simon Minett, Director of COGEN Europe and Vice-Chairman of WADE, for his substantial contribution in the development of these draft principles.

For an updated version of WADE's Principles of Regulation, visit the WADE website at www.localpower.org

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